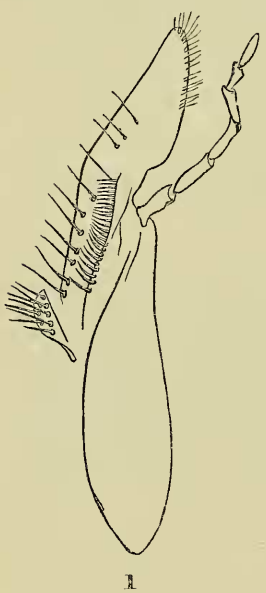
6. Notes on the Form of the Comb (Pecten) in different Andrenidæ and Apidæ, and on the alar hooks of the Species of Sphecodes and Halictus. By Miss E. F. Staveley*.

I have made a few notes in the hope of saving your time and eyes; but I fear they are of very little value; and, as you are aware, I know so little of what has been already written on the subject, that my notes, even if correct, may not be new. Besides this, my examination of the parts of the mouth has as yet been confined to about twenty-six Bees of various species and the three sexes.

There are some peculiarities in the maxillæ of the Bees which I think might serve as generic or specific characters, and which I believe have not yet been used for that purpose.

One is the presence of a row of strong, flat hairs or teeth, forming a sort of comb, varying much in form and situation.

In all the *Andrenidæ* where I have found it, it forms a wavy line, commencing near the base of the upper joint of the maxilla about midway between the two margins, as in *Andrena cingulata*, ♀ (figs. 1, 2).



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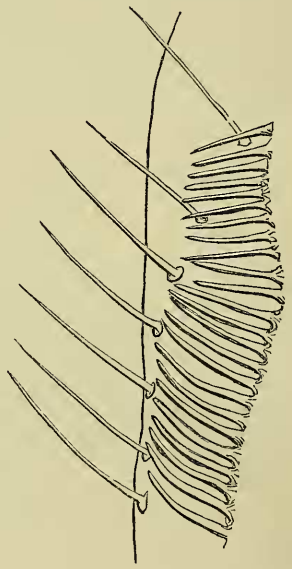

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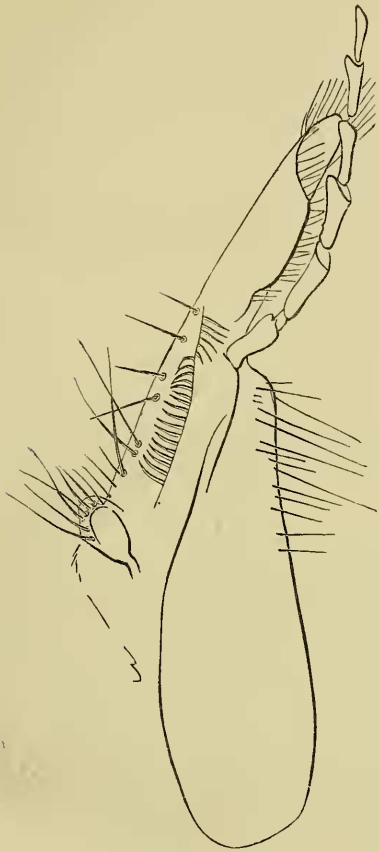
* Communicated by Dr. J. E. Gray with the following letter:—

"I beg of you to lay the following observations, which Miss Staveley has sent to me, before the Society. They indicate some characters which appear to have hitherto been overlooked.

"*Dr. Sclater, F.R.S., &c.*" "J. E. Gray."

In some, as *Andrena nitida*, ♀ (figs. 3, 4), the direction of the teeth is reversed in the course of the row. The row of hairs is



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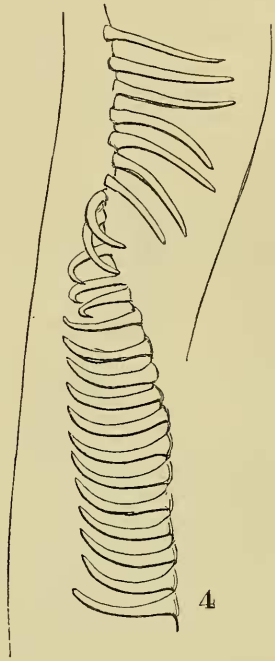

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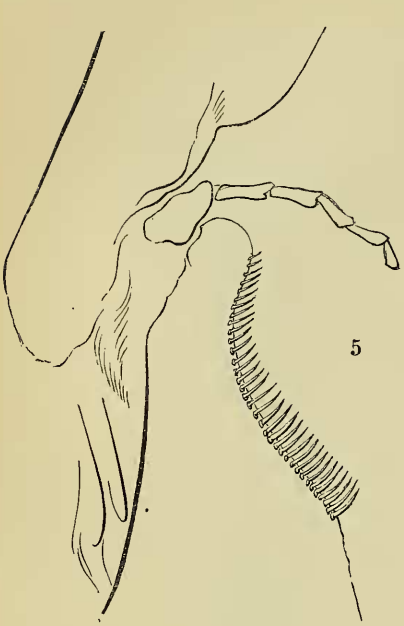
figured by Kirby in his work on 'British Bees,' at t. 1. f. 4 *e*, and called by him, in the explanation of the plates at page 226, "*setæ rigidiusculæ*;" but I do not find any mention of them in any other part of the work.

In the *Apidæ* it is invariably at the upper part of the lower joint

of the maxilla (fig. 5), and, with one exception, is marginal. In *Panurgus* (fig. 6, *P. banksianus*, ♀), the first genus of the *Apidæ*



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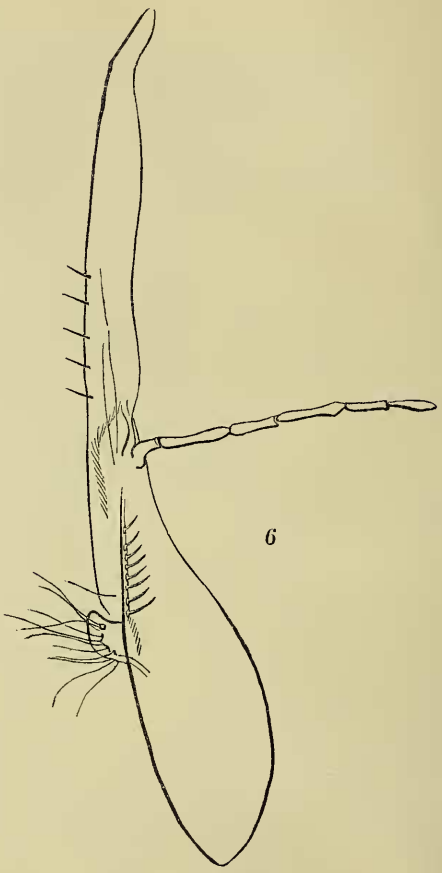

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(and of which Mr. Smith remarks that in habit it is precisely similar to *Andrena*), the comb resembles that of the *Andrenidæ* in not being marginal, while it agrees with that of the other *Apidæ* in being near the top of the second joint. This series of spines is also figured in Kirby, at t. 10. f. 1 *c*, t. 11. f. 2, t. 12. f. 6 *c*, and t. 13. f. 3 *a*; and in the chapter headed 'Termini,' at p. 94, is called the "*pecten*;" but, though several forms of it are figured as above, I do not find it mentioned in the description of the species.

I subjoin a list of the insects in which I have looked for it :—

ANDRENIDÆ.

Colletes daviesana, ♂ (teeth much the longest at the lower end).
Andrena cingulata, ♀, figs. 1, 2.
—— nitida, ♀, figs. 3, 4 (comb reversed near the top).
—— clarkella, ♀ (comb reversed near the base).
—— ——, ♂ (comb reversed).
Cilissa leporina, ♀ (comb of four teeth).
—— ——, ♂ (comb of three teeth).
} Comb not marginal, commencing near the base of upper joint of maxilla.

Sphecodes subquadratus, ♀.
Halictus leucozonius, ♂.
—— morio, ♀.
Dasypoda hirtipes.
} Comb not present.

APIDÆ.

Panurgus banksianus, ♀, fig. 6. Comb not marginal.
Eucera longicornis, ♀ (fig. 5).
—— ——, ♂.
Bombus terrestris, ♀.
—— lucorum, ♀.
—— ——, ♂.
—— ——, ☿.
—— latreilliellus, ☿.
Apathus campestris, ♀.
Apis mellifica, ♂.
Euglossa cordata.
} Comb marginal.

} Comb on upper part of second joint of maxilla.

Nomada furva, ♀ *.
Epeolus variegatus, ♂ *.
Cœlioxys vectis, ♀ *.
Osmia rufa, ♀.
Chelostoma florisomne, ♂.
} Comb not present.

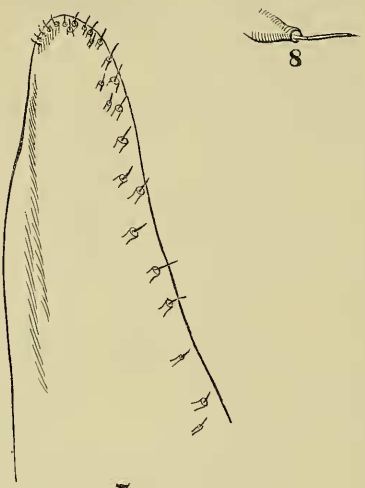
There is also an appendage to most of the maxillæ (and when absent it may possibly have been torn off in dissection), which seems too delicate to assist in the mechanical work for which the combs are probably used. It is a small membranous lobe, covered more or less thickly with long hairs, and situated on the lower joint of the maxilla, on the opposite side to that of the palpus (see figs. 1, 3, 6).

In many of the maxillæ there are several projections or small *tubes* (as I shall for convenience call them, having little doubt of their tubular construction) generally tipped by a hair, and in appearance strongly resembling the small tubes which exude the material of the web from the spinneret of a spider. They are in various situations: sometimes at the apex of the maxilla; forming sometimes an irregular line nearly the whole length of the upper joint; sometimes in a cluster close above or below the maxillary palpus; sometimes in two clusters, one above and one below the palpus. I would call your attention particularly to the straight tubes near the apex of the maxilla of *Epeolus variegatus* ♂ (fig. 7), and the flask-shaped tubes near the palpus in *Osmia rufa* ♀ (fig. 8)†.

* Parasites. I have as yet found no parasitic Bee with the comb.

† After writing the above paragraph, it occurred to me that Dr. J. Braxton Hicks, in a paper read before the Linnean Society (and printed in their Trans. vol. xxiii. part 1, p. 139), had preceded me in the observation of these organs, and I hesitated to send the notes for printing; but, on examination of his paper, I am inclined to think that the tubes which I have described in the maxillæ of the Bees are not necessarily of the same nature as the organs observed by him in

Is it possible that these tubes, which, as I have observed, are remarkably similar in appearance to those in the spider's spinneret,



may be of the nature of salivary glands? It is easy to imagine the use of such a provision in the management of the materials of the nests and the storing of food, even if not also in the assistance of digestion; while it appears to me that there is analogy in favour of such a supposition, the House-fly exuding from its mouth a drop of moisture while feeding on sugar or other hard substance, while the Gnat, with still another form of mouth, is supposed to inject a poison into the wound inflicted by its proboscis.

I believe that somewhat similar tubes exist in the mandibles of some of the Bees and Wasps.

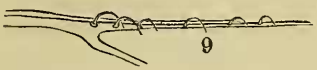
The mandibles of some of the *Apidæ* have a transverse ridge of strong hooked hairs (besides other hairs in various parts). In the mandible of *Apis mellifica* ♀, they are very visible.

With the above objects I send specimens of the hind wings of various Hymenopterous Insects, the observation of which has confirmed me in my former opinion as to their usefulness as distinctions; but as I have arrived at no new results, not having had the means as yet of representing more than a very limited number of genera, I will only remark on one variation from the usual arrangement of the distal hooks, which occurs in the genera *Sphecodes* and *Halictus*.

The distal hooks of the Bees are usually at regular or at regularly diminishing intervals; but in these two genera, one or two of those

various parts of insects, with the exception of those which he figures Tab. 18. R. *a*, and which I have mentioned above as tubes "in a cluster close above the maxillary palpus."

in the middle of the row are separated from the rest by a space double the size of that which is between the other hooks (figs. 9,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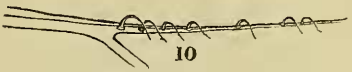
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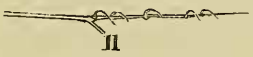
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10, 11); and if this is found to be in all the species, it is a distinction easy to observe.

April 8, 1862.

Dr. J. E. Gray, V.P., in the Chair.

The Secretary announced the acquisition by the Society for their Menagerie of a pair of living Paradise-birds (*Paradisea papuana*). Mr. A. R. Wallace (the well-known traveller and naturalist, who had been engaged these last eight years in exploring the more little-known islands of the Indian Archipelago) had for some time held a commission to obtain living Birds of Paradise for the Society. But though Mr. Wallace had visited in person the islands inhabited by several species of this magnificent group of birds, he had failed in his efforts to preserve the birds alive when captured, and had given up all hopes of being successful in his object. A short time before Christmas 1861, when in the interior of Sumatra, Mr. Wallace had received information of two specimens of the Lesser Birds of Paradise (*Paradisea papuana*) being alive in captivity at Singapore. Mr. Wallace immediately proceeded to that place, purchased the birds, which were then in the hands of a European merchant, and left by the following mail for England, arriving in safety in London with his valuable burden on the 1st of the month.

The two Paradise-birds had been lodged in the upper part of the Zoological Society's old museum, a room having been fitted up for their reception with a large cage of galvanized wire, 20 feet long by 11 in width. As they were both males, it had been found necessary to keep them apart, the sight of one another, or even of a Paradise-bird's plume waved near them in the air, producing in them great excitement. The cage had been, therefore, divided by a screen which excluded the light, and the two birds placed in the separate compartments. The remarkable side-plumes which ornament the males of the true *Paradiseæ* when in full dress were as yet but partially developed in these specimens, but in a few weeks, if the birds continue to thrive, would probably attain their full dimensions.